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A Scenario-Generation Package for Assessing and Training Leader Skills

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14. ABSTRACT *(Maximum 200 words)*:
This report documents the development of a scenario tool set with variable factors that can be used to assess or train leader skills as the Army transitions to the Future Force. The components of the tool set can be tailored to produce 45 basic scenarios. Each scenario can be altered by injecting events to create more exercise conditions. All source documents needed for leader planning are available, to include supplemental map boards; each can be modified to conform to the desired exercise requirements. A User's Manual containing a step-by-step guide and a specific example of how to use the scenario tool set is available to assist evaluators and trainers. Use of these scenarios requires advanced planning to select the modules, components, and incidents to create the desired situation. The scenarios and resulting exercise vignettes, administered in a constructive or virtual simulation, will provide a realistic representation of expected battlefield events to allow leader skills to be assessed or trained. The scenario tool set can be used to train leader skills or research the impact on leaders of changes in organizations or technological capabilities. It can also be used for generating standardized scenarios for analysis purposes.

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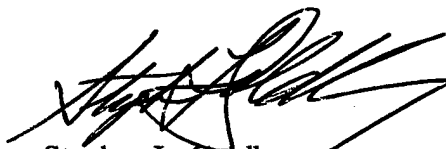
FOREWORD

The U. S. Army Research Institute for the Behavioral and Social Sciences (ARI) Infantry Forces Research Unit at Fort Benning, Georgia is conducting a multi-year research effort to develop exemplar training support packages for small unit leaders based on new training methods demonstrated to be most effective for facilitating rapid, accurate decision-making. As already evidenced in conflicts around the world, the battlefield environment continues to change, presenting leaders with significant operational challenges with a noncontiguous and asymmetric threat. A major problem is determining what to train, how to train, and how to measure success of training in preparing small unit leaders to take better advantage of Future Force capabilities, operational concepts, and employment techniques to counter this threat situation. Trainers must understand how to effectively train and assess leaders so these Future Force leaders will be proficient in the employment of complex battlefield information systems to assist them in achieving mission success.

This report documents the development of a tool set that can generate scenarios for use in constructive and virtual simulations to assist in assessing and training leader skills as the Army transitions to the Future Force. This tool set contains the necessary components to create 48 basic scenarios; two different terrain areas, against two distinct enemy forces, conducting two offensive missions, employing three possible force structures, under two weather and time conditions. In addition, more flexibility can be achieved as a multitude of optional events can be injected to influence the battlefield situation and to impact how the rules of engagement are followed, thereby creating more scenarios. Scenario variables can be altered in a controlled manner to allow a researcher or trainer to focus on desired leader skills. All materials, including map boards and operations orders from higher headquarters, are available to assist the leader in planning for his mission. A User's Manual is provided to assist researchers and trainers in preparing to use the scenario tool set.

It is envisioned that this training support material will be used by ARI and other agencies to explore potential methods and techniques for assessing and training leaders, platoon leaders and company commanders, as the Army transitions to the Future Force. The scenario tool set has been transitioned to the Lead Technical Integrator on the Future Force Warrior Training Team for use in developing training media for leader planning and small-unit rehearsal.

Stephen L. Goldberg
Acting Technical Director

A SCENARIO-GENERATION PACKAGE FOR ASSESSING AND TRAINING LEADER SKILLS

EXECUTIVE SUMMARY

Research Requirement:

As evidenced by ongoing events around the world, the potential battlefields for the U.S. are changing. Future conflicts will differ considerably from the traditional conflicts where enemies were fairly well defined and battlefield boundaries were discernable. The Army is transforming from the current to the Future Force to be prepared for the anticipated complexities of future warfare. To be successful, Future Force leaders must be proficient in employing available capabilities and technologies to achieve success in operational missions. There is a need to isolate and assess the various factors that influence leader skills, including decision-making, in complex situational environments when leaders use an array of information technologies. Leaders must be trained in the necessary skills to be successful small unit leaders in the Future Force. This project developed a scenario tool set that can be used to assess and train the required leader skills for platoon leaders and company commanders.

Procedure:

First, an assessment was made that the set of scenarios for company and platoon levels should be flexible so the tool could be used over a period of time and modification of scenario parameters could be made as needed. A brain storming session of military professionals yielded the key building block structure for the scenario tool set. The definable factors of the scenarios were the same six key factors that leaders currently use to visualize and assess the battlefield: Mission, Enemy, Terrain and weather, Troops and support available, Time available, and Civilian considerations (METT-TC). Different constructs were identified as to how the scenario pieces might be structured to allow the desired flexibility. To locate and create the content for materials to include in the scenario components, web sites with military and terrain information were examined, doctrinal publications reviewed, and the latest periodical publications addressing the Future Force and the anticipated operating environment were examined. Military personnel intimately familiar with emerging lessons learned from recent U.S. military operations were consulted. At various stages throughout development of the tool set, military doctrinal experts were consulted to ensure the scenario components provided trainers and leaders with the information they would need to plan for and execute the designated missions.

Findings:

The scenario tool set provides a repository of components for multiple applications. These components permit the assembly of scenarios for many aspects of leader performance and training. They provide the evaluator or researcher with "plug and play" components that can be tailored to evaluate specific factors, such as new technologies or changes in unit organization.

Scenarios can be assembled with limited effort to produce 48 base scenario options for the company commander and 48 for the platoon leader. These base options can be further varied through the insertion of events from the optional master incident list during the mission.

The scenario components provide information on the terrain, including light and weather data; the mission that must be accomplished; the friendly force that is available, including biographies on key unit personnel; and an enemy situation. A master incident list has optional events to increase the challenges for the leader, impact the flow of the operation, and interject civilian considerations. Map boards with overlays are provided to assist the leader. A User's Manual guides researchers and trainers in applying the tool set.

Utilization of Findings:

The scenario tool set can be used in training and evaluating platoon leader and company commander leadership skills as the Army transitions to Future Force capabilities and technologies. The scenarios can be used to train leaders now before the actual new equipment and capabilities are available. Researchers can assess leader skills with varied technological capabilities – "what if" tradeoffs. They can also determine the impact on a leader's decision-making as a result of a new force organization, equipment, or technology. The scenario tool set also provides a foundation to support current and future research and training efforts. Far from a static, one-time use package, the modular scenario components lend themselves to adaptation and tailoring for a variety of purposes. Scenario components can be updated or modified based on information and lessons learned from real-world operations and training exercises.

A SCENARIO-GENERATION PACKAGE FOR ASSESSING AND TRAINING LEADER SKILLS

CONTENTS

CONTENTS (continued)

List of Tables

A SCENARIO-GENERATION PACKAGE FOR ASSESSING AND TRAINING LEADER SKILLS

Introduction

The military community at large, and especially the Army, has been projecting that the nature of war is changing. Future conflicts will be considerably different from the traditional conflicts of the early and mid 1900's where enemies were fairly well defined and battlefield boundaries were discernable. Leaders need to be trained to operate in these changing conditions. The purpose of this research effort was to develop a tool set that could be used to generate a variety of scenarios that represent the varying battlefield conditions as the Army transitions to the Future Force. This tool set would assist trainers and researchers as they prepare leaders for their roles in combat.

The Changing Battlefield

A major influence on the nature of war is that the world situation has changed drastically during the past half century, especially since the end of the Cold War. Political alignment among nations has shifted from a bipolar structure to numerous "partner affiliations" based on different factors – economic interests, religion, historical events, desires for power and control, geographic location, and ethnic background to name but a few. One fall-out of these political alignments is a continuous uncertainty as to what nation states will form a common alliance under various world conditions.

In addition to the changing world political alignment, we have witnessed a dramatic shift in how wars are waged. Major military powers no longer face each other. Massive firepower and large forces are no longer the norm for winning wars. Precision munitions with the minimal force are preferred. The native warlords of Third World countries with their ill-equipped and poorly trained tribes, as in Mogadishu, have survived the presence of the U.S. military and other international forces. Drug cartels and bands of irregular forces throughout South American countries continue to cause extensive disruptions and difficulties for the governments of their countries as well as the United Nations forces that have attempted to quell the problems.

Not only is the nature of war becoming different, the nature of the battlefield is rapidly changing. Weapon lethality, for both U.S. forces and potential enemies, continues to improve due to enhanced technologies, increased range, and the proliferation of "smart" devices. Automation and information technology are being exploited in military equipment and operations. Battlefield digitization will lead to new ways to command and control forces as well as to influence the information flow and how commanders make decisions. Throughout all of these changes, Soldier and leader performance is important to the success of the Army, as it undergoes re-engineering and transformation efforts (Hartzog & Canedy, 1998).

Due to the uncertainty of political alignments, potentially rapidly changing world conditions/events, and the U.S. intent to maintain worldwide involvement with activities that impact our national interests, the U.S. Army could find itself in a myriad of environments with significantly varied conditions with limited advanced warning. The environment could be the

mountainous region in Afghanistan, the tropics of South America, the vast deserts of the Middle East, or large, very different urban areas such as in Sarajevo, Mogadishu, or Baghdad. The military mission and conditions could be to provide humanitarian assistance or disaster relief for a needy nation, to act as a buffer between warring factions at the request of an international organization, or to counter the overt military aggression of some country. The U.S. Army could be required to accomplish missions across the full spectrum of conflict; usually by executing some combination of offensive, defensive, stability, and support operations. Having the ability to evaluate and assess leader skills as the Army transitions to these potential future situations under varying conditions would be a valuable asset.

The Transforming Army

To prepare for such diverse requirements the Army is undergoing a "transformation" to ensure that it is prepared to be an optimum fighting and peacekeeping force in the 21st century. Called the Future Force[1], it would be able to conduct operations across the spectrum of conflict, anywhere in the world, with limited prior warning.

The Army's total conversion to this Future Force is a long-term, phased process. As the Army transforms, the current force will still play a vital role until after 2025, even as the Future Force is fielded (Eaton, 2002). Therefore, interface between the current force and the Future Force is an absolute necessity. To ensure these forces are interoperable, many doctrine, training, and leader development challenges must be addressed.

For example, the structure of small unit organizations might be altered to provide the optimum force for the future. Over the years, the Army has explored the use of information technology as a possible means to reduce the various echelons of command. While technology can reduce the workload for leaders, some items, such as developing alternative courses of action, evaluating risks, and anticipating Soldier reactions (friendly and enemy) require a leader's attention (Wass de Czege, 2002). Wass de Czege also believes that in spite of information technology, the span of command at company level may need to be reduced "to achieve even higher leader to led ratios, to compensate for mission complexity with organizational simplicity" (p. 9). Future Force unit organization structure is still undetermined.

As stated in TRADOC (Training and Doctrine Command) Pamphlet 525-3-90, future Force tactical units must be capable upon entry into an operational area to immediately conduct "simultaneous, distributed, and continuous combined arms operations, day and night, in open, close, complex, and all other terrain or weather conditions throughout the battlespace" (U. S. Army TRADOC, 2002, paragraph 2-1b). The tactical units would be a combined arms force at the lowest levels so as to provide them the optimum capabilities for the close-in ground fight. In addition, these units "... will *see first, understand first, act first, and finish decisively* on the tactical battlefield" (U.S. Army TRADOC, paragraph 2-1c). Advanced technologies are expected to provide this leap-ahead capability. The success of these units will rely on "the

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[1] At the start of this research effort, the term "Objective Force" was used to refer to the Army of the future. Some of the references cited in this document used the term "Objective Force." During this project the approved term was changed to the "Future Force." To preclude potential confusion in terminology, all references to "Objective Force" have been changed to "Future Force" in this report, except when used in a direct quote.

synergy of maneuver, firepower, protection and leadership, empowered by dominant situational understanding resident in a vibrant information network" (U.S. Army TRADOC, 2002, paragraph 2-1c).

Transforming to the Future Force with the capabilities and characteristics described above is a significant challenge, in and of itself, but the challenge is even greater. Given that the current force will be a key factor for at least 20 more years and must be capable of operating with the Future Force, the diversity of worldwide situations in which the forces might be employed, and the significant technological capabilities that will likely be available, the bigger challenge is to conduct the necessary tradeoffs to optimize the design and development of the different forces over this transformation period. Much analysis, modeling, and simulation will be required to support the system-of-systems trades necessary to ensure optimal Future Force performance at minimal weight, cost, and delay while still maintaining the current force and transitioning through interim stages.

The complications continue. In addition to the extensive organizational and equipment tradeoff analyses that must be accomplished as the Army transforms, methods and means of training and preparing Soldiers and leaders must be examined and will probably require transformation. Training budgets and funding will likely become more constrained. Therefore, more innovative and less costly training techniques must be developed. Leaders of this combined arms force must be able to train individually and collectively in realistic environments while minimizing training resource expenditures (time, dollars, equipment, etc.). With the advances in technology, conducting training events, especially for leaders, and experimenting with evolving concepts in simulations and virtual environments are areas that require continuing exploration.

The Challenge of Transformation

At the heart of both the U.S. Army transformation and its continued commitments around the world are the Infantry ground forces. This is not likely to change as the Future Force is designed and developed. The Infantry leader must be able to interface and interact with the other elements on the battlefield in order to maintain information awareness, coordinate actions, and fight or employ his force effectively. The potential threats to the Infantry force will be more diverse and technologically advanced as time progresses. Infantry operations will occur in complex and urban terrain, political agreements will constrain the size and composition of committed forces, rules of engagement will restrict the application of combat power, and the enemy will attempt to capitalize on the asymmetric employment of their existing capabilities to attack perceived weaknesses (Eaton, 2002). Simultaneously, the current force units will be involved in a transition to the Future Force.

Given the advent of new technologies, it seems clear that information technology systems will be at the center of any force, and therefore, at the center of training. This increases the requirement for training cognitive skills. Studies have shown the potential value of training small unit leaders in virtual environments in cognitive-based activities and decision-making skills (Pleban, Eakin, & Salter, 2000; Pleban, Eakin, Salter, & Matthews, 2001; Strater, Endsley, Pleban, & Matthews, 2001). A key component of any training and evaluation program is the

situation or scenario in which the learner is placed for the training experience. As stated by Graham and Dyer (2002), "The challenge remains in developing scenarios that train more advanced thinking skills. There remains an overarching issue of how to incorporate intelligent feedback, especially for training cognitive skills." (p. 9). Quality scenarios that provide the necessary detail to train the desired skills, yet provide sufficient flexibility to accommodate the myriad conditions anticipated while transitioning to the Future Force, are crucial if leaders are to be properly trained, the impact of various technologies are to be assessed, and operational employment tradeoffs are to be evaluated.

The work documented in this report was designed to further advance the Army's capability to evaluate the skills of Infantry small unit leaders, specifically platoon leaders and company commanders, as the current force transforms into the Future Force. This project explored a critical issue, the Infantry small unit leader conducting a variety of missions, with the flexibility of adjusting the enemy and environmental conditions while employing the emerging Future Force doctrine, organizational structure, and equipment. This research lead to the production of a tool set for assessing leader skills and determining the impact of Future Force technologies upon the leader's ability to accomplish assigned missions.

Making Leaders for the Future Force

The requirement for quality, professional leaders for the Future Force is widely recognized. In "A Statement on the Posture of the United States Army 2003" presented to the committees and subcommittees of the 108th Congress, the Secretary of the Army and the Chief of Staff, Army stated that, "… leader development is the lifeblood of the profession. It is the deliberate, progressive, and continuous process that trains and grows Soldiers and civilians into competent, confident, self-aware, and decisive leaders prepared for the challenges of the 21st Century in combined arms, joint, multinational, and insurgency operations" (p. 12).

It is not sufficient that leaders are *capable* of operating new technological capabilities, they must be *proficient* in operating and employing all assets at their disposal in order to maximize their units' opportunity for success on future battlefields. A prime example is the ever-expanding availability of "digital" equipment. In this instance, in April 2003 TRADOC representatives briefed a plan for integrating digital education into institutional training. The plan establishes responsibility for various areas of digital training. Two of the specific purposes of the plan are:
- Produce Soldiers with the skills, knowledge, and attributes needed to operate and maintain the different pieces of digital equipment, and
- Developing leaders that understand how to leverage digital systems to accomplish a unit's mission.

Not only must leaders be able to employ the equipment themselves, they must be able to train and then supervise their subordinates in employing available technologies. As technologies evolve and change, leaders must remain current with their skills and knowledge. Technology proficiency is a necessity.

Even with digital technology advances, leaders and their Soldiers must be prepared to act independently based on the battlefield considerations and the execution guidance from those

4

above. The potential immense complexity of future wars requires that leaders can maximize the contribution of all assets at their disposal. This includes the wise use of time as well as the efficient employment of both equipment and personnel. While many historians might disagree with him, van Creveld (1989) asserts in his book, *Technology and War*, that technology has in the past and continues to permeate all things in war. Leaders must be proficient in employing technology in order to achieve mission success.

To accommodate the changing battlefield and take advantage of technologies, flexibility could become even more important. In Field Manual (FM) 3-06.11 *Combined Arms Operations in Urban Terrain* (Department of the Army (DA), 2002), the Army's doctrine acknowledges that there could likely be confusion and crossover between types of operations and the conditions under which they are occurring. There might be many types of operations ongoing simultaneously and those operations might need to be transformed quickly based on enemy actions. The media used a phrase, "The 3-Block War", frequently during Operation Iraqi Freedom (OIF). While not officially defined, it implies that three major different operations could be required of the same unit simultaneously as urban operations unfold. On one "block", the military forces are actively engaging the enemy force in combat operations, while one "block" away, the force is providing security for the area following combat operations, and in the third "block" the military force is already providing humanitarian assistance to the civilian population. Leaders must be prepared to make these adjustments rapidly; at times making the transition decision independently, based on the evolving situation.

A final point is that future leaders must learn from history, that the basic principles of war will remain valid, but their application could be altered radically. In discussing Iraq's plan for the defense of its country from the U. S. attack in 2003, Peters (2003), a retired U. S. Army officer and the author of *Beyond Terror: Strategy in a Changing World*, opines that, "Far from technically incompetent, Saddam's plan was right out of Clausewitz." However, he claims that the Iraqis, and their Russian advisors for the defense plan, "... had no sense of the battlefield awareness, speed, precision and tactical ferocity of America's 21st century forces." The U.S. military fought the first post-modern war, a digital one, while the defenders relied on the book from historical victories – the way of warfare has changed. Leaders must be prepared for this new form of warfare.

Taking Advantage of Technology

According to most accounting records, the U.S. is spending billions of dollars each year for new computers, automated technologies, and communications systems. According to Sinnreich (2003), "Today, new information technology is at the very heart of defense transformation. In every Service and at every echelon, better, faster, more comprehensive information acquisition and distribution mechanisms are seen as prerequisite to a more agile, lethal, and ultimately effective fighting force" (p. 8). Having timely information is a great asset. However, becoming reliant on technologies to gather, interpret, and disseminate information can lead to a false sense of security.

Therefore, as Sinnreich (2003) continues, "The difference isn't in the technology, but rather in the institutional culture in which it is embedded" (p. 8). He relays a story of how a

large U.S. corporation was able to gather useful information in a timely manner, conduct just-in-time research, then pass the information for the possible use and financial benefit of disparate portions of the company. Technology was employed to monitor and gather information, leaders assessed and evaluated the impact, and then they disseminated it for the best use of subordinates. He concludes by stating, "... the touchstone of information superiority is a culture bred to exploit it" (p. 8).

Technological advances will provide increased capabilities for our fighting forces on the future battlefields. The advent of digitized systems has some advantages; e.g., provides precision location information, allows transmission of volumes of data rapidly, and permits leaders to conduct collaborative planning while separated. Even with new technologies anticipated for the future, such as the Future Force Warrior (FFW) and the Future Combat System (FCS), leaders have recognized that advanced technology alone is not sufficient. Referencing the advanced warfighter experiment Desert Hammer VI conducted at the National Training Center (NTC), Edwards (as cited in DA, 2001, p. 1-13) noted that Army leaders confirmed that digital technology increased unit performance, but Soldiers are still the most valuable resource on the battlefield. Leaders must know how to use available systems to their advantage.

Flexible Scenarios to Train and Assess Performance

The purpose of this research effort was to develop scenarios that could be used in training and assessing the performance of leaders, platoon leaders and company commanders, as the Army transitions to the future battlefield situations. This set of scenarios would provide the foundation for placing leaders in exercise situations during training that could help prepare them for future situations they might face in real conflict. These exercise situations would also provide a research opportunity for personnel who want to assess leader preparedness or even conduct tradeoff assessments of how leaders respond to varying situations when the resources available to them are altered.

Method and Procedures

The first step in this project was devoted to conducting an assessment of the challenge in developing a set of scenarios that could be used at multiple organizational echelons and that incorporated the flexibility to modify various scenario parameters. A brain storming session of military professionals yielded the key considerations in determining the building block pieces for a scenario. Different constructs as to how the scenario pieces might be structured to allow the desired flexibility were then drafted. A search was conducted to locate the content of materials that might be included in the scenarios. Web sites with military and terrain information were examined; doctrinal publications were reviewed; the latest periodical publications addressing the Future Force and the anticipated operating environment were examined. Military personnel intimately familiar with emerging lessons learned from recent U. S. military operations were consulted.

During the information search for scenario components and content, the underlying structure of the scenarios that would potentially satisfy all requirements was considered in depth.

6

The remainder of this section of the report explains the rationale for why the various scenario components were selected, and the considerations that were used to determine the structure and content for each of the components.

Determining the Requirements for Flexible Scenarios

Understanding the essential involvement of Infantry forces and their leaders in current conflicts and their anticipated involvement in future conflicts, the task called for the development of a "tool set" to assist in analysis of leader skills. It was anticipated that the leader's experience and training would impact on his performance. The tool set had to permit examination of performance under variations of mission and the environment, as well as the introduction of new technologies and capabilities.

Previous experiences with research in virtual environments for Soldiers (Knerr et al., 2002, 2003) and other leader assessment research efforts indicated the need for realistic, challenging scenarios. In these previous efforts, researchers established limited objectives and evaluation criteria to examine a specific area. Focused scenarios were then developed to facilitate evaluation of a single or fixed purpose. However for this project, the goal was greater flexibility in design and reuse of scenarios in order to reduce the work required for scenario development for research and training exercises. The solution seemed to be a series of scenarios with variable components or characteristics.

The desired characteristics for a scenario tool set were identified via brainstorming among military experts, studying lessons learned from military operations, and a subsequent integrated analysis. It was determined that the scenarios should:

- allow for exercising all or a significant number of identified leader tasks,
- be modular in nature and permit controlled variation of key mission, environmental, and assessment factors,
- be scalable and variable, using predetermined factors and events in a controlled manner, to generate situations for research and training,
- be an on-the-shelf, self-contained product requiring minimal preparation before use,
- be complete with all materials that a leader normally uses in planning operations,
- include all of the materials needed by evaluators, testers, trainers, and exercise system technicians, and finally, but extremely important,
- present a challenging and realistic training opportunity for the leader.

Other general principles that would increase the value and usefulness of the scenario tool set were identified as well. First, multiple basic scenarios were needed, and while their characteristics must require similar leader actions, they should not appear to be the same. Next, the scenarios needed to provide a means of comparative analysis through observation of a leader's performance of the same or similar tasks. Lastly, the scenarios needed to provide for the controlled variation of critical factors to permit comparative evaluation of each variable on the impact of leader performance.

The model for the scenario tool set was an adaptation of the evaluation technique and framework used by the TRADOC during the "cold war" era. The Scenario Oriented Recurring Evaluation System (SCORES) provided a framework to develop a series of scenarios to assess performance deficiencies in different areas – organizations, doctrine, tactics, training, and materiel (DA, 1986). The SCORES scenarios provided a means to vary or tailor selected events or critical factors. These controlled variations provided a means to facilitate the identification of performance shortfalls or improvements. Within the scenario, unit organizations, tactics, or changes in equipment and/or materiel could be precisely varied in a controlled manner. Using SCORES, combat and doctrine developers in TRADOC compared and evaluated aspects of the performance of a force based on the controlled variations. Comparing conflict resolution outcomes in conjunction with unit or equipment performance in scenarios with these varied factors provided tangible measurements to validate force deficiencies or improvements based on the presence of the controlled variable.

For example with SCORES, the characteristics of a new Infantry fighting vehicle (weapon performance, crew protection, speed, and logistics impact) could be inserted into a scenario against an opposing force (OPFOR). The performance of the friendly force and battle resolution or outcomes could be compared to a force equipped with the current Infantry fighting vehicle. The resulting data provided tangible evidence on the value of the force modification. Data provided information on which to base force restructure decisions. The data also provided doctrine writers with indications of future requirements for tactics, techniques, and procedures to optimize future capabilities or to minimize limitations of the new system. The scenarios also helped identify future training requirements. These variable scenarios and the subsequent analysis of data resulting from the scenario execution provided a critical insight to performance prior to procuring equipment or adapting changes to force structure or doctrine.

The SCORES process, however, was generally resource intensive, requiring complex computer driven exercises of major forces in classic scenarios on terrain and against the enemy anticipated on the plains of Europe or other "cold war" contingencies. The intent of the current effort was to develop flexible scenarios that could be scaled to be less resource intensive in terms of execution, yet provide the same general capability to analyze the impact of variables. Multiple scenarios were designed as single-mission, limited-duration, short movement, dismounted vignettes suitable for use in evaluations and exercises ranging from tabletop map exercises, to exercises in a virtual environment (e.g., the Squad Synthetic Environment at Fort Benning, GA), or with the JANUS system. Scenarios should require limited supplemental support from nonmilitary or military subject matter experts as scenario developers, role players and trainers.

To comply with TRADOC guidance, the scenarios needed to be structured to provide the opportunity for or elicit leader performance of each aspect of the Universal Joint Task List. In a Memorandum dated March 31, 2003, the TRADOC Commanding General applauded efforts to address doctrine from a Joint perspective and directed that the Universal Joint Task List (UJTL) construct be used for Future Force concepts and combat development efforts. The UJTL includes:

- Deploy/conduct maneuver
- Develop intelligence
- Employ firepower
- Perform logistics and combat service support
- Exercise command and control
- Protect the force
- Operate in a chemical, biological, radiological, nuclear, and explosive environment.

While the primary intended use of the scenarios would be as a tool for evaluation, following the TRADOC Commander's guidance provided an additional application. The scenarios can provide a realistic training experience for the evaluated leader by allowing him to exercise his skills under varying conditions or factors.

Considering the Contemporary Operating Environment

To provide a realistic evaluation and training experience, the scenarios needed to be planned and executed in a mission environment that provided high fidelity to current and expected future battlefield situations and conditions. Far from the threat model of the former Soviet Union (FSU), the OPFOR must be portrayed as an adaptive threat with the capability to react and innovate. The operations outlined in the scenarios should exploit enemy vulnerabilities, but vulnerabilities exposed for only limited periods or under certain conditions. The leader must be confronted with an asymmetric battlefield, the threat of weapons of mass destruction, and non-combatant civilian considerations. In short, the leader must be immersed in a Contemporary Operating Environment (COE) as described in a handbook developed by the Center for Army Lessons Learned (CALL, 2003).

Unclassified studies and After Action Reviews from the experiences of U.S. forces in Somalia, as well as from Operations Enduring Freedom and Iraqi Freedom provided a wealth of information on operations in the COE (Canada, Department of National Defense, 2002; CALL, 2002). In an effort to avoid potential classified or sensitive details of current operations, or link together information that could be of value to an actual adversary, or address evolving countermeasures, tactics, techniques, and procedures, specific current operations were not used. Instead, the study of Soviet tactics in Afghanistan published by the National Defense University (Grau, 1996) and the companion study of Mujahideen tactics in the same conflict published by the Marine Corps Studies and Analysis Division (Grau & Jalali, 1995) provided a superb foundation into military operations in the COE. These studies framed the enemy situations and reactions captured in the scenario tool set.

Selecting an Enemy / OPFOR

To provide flexibility, analysis indicated that more than a single threat force should be available in the scenarios. Examples of the threats facing U.S. forces are cited here. Television news reports from the recent and on-going U.S. conflict in Afghanistan showed local militias fighting Taliban forces with weapons that ranged from dismounted infantry and horse cavalry to T-54/55/62 tanks, BTR-60/70 armored personnel carriers, and D-30 122-mm howitzers. This equipment was left behind by Soviet forces or procured from regional arms dealers. News

9

reports from recent tribal and regional conflicts in Africa showed similar equipment. Capable armored vehicles or vehicles sufficient to match, counter, or overwhelm an adversary's equipment or capabilities are readily available on the international market.

In the Caribbean, Cuba's Army, including the ready reserve and active duty, boasts a force structure of 85,000 Soldiers with 12 formations classed as armored or mechanized divisions. While unclassified estimates indicate that a high percentage of Cuban equipment may be in storage due to lack of spare parts, their equipment holdings are significant. Cuban forces are estimated to have nearly 1,000 T-54/55/62 tanks, approximately 1,200 armored personnel carriers (a third of which are the BMP infantry fighting vehicles), and 70 or more mobile air defense gun and missile systems (U.S. Naval Institute Military Database, 1998). As observed with the FSU, military equipment holdings in excess of requirements may be converted to hard currency for military force modernization, to buy needed parts, or might become gifts or discount sales to influence other nations. Nations, tribes, or factions in conflict provide a ready market for excess military hardware. While these markets normally deal in early model, easier to maintain systems, more modern systems are also available and provide a quantum advantage to their owners through improved capabilities.

The T-72 is maintained as the main battle tank in the armed forces of 28 nations. Since the early 1970's more than 20,000 T-72 tanks were produced in the factories of the FSU in a wide range of variants. Additionally, the tank was built under license in Czechoslovakia, India, Poland, and the former Yugoslavia. While in the hands of the Iraqi Army, it proved to be no match for the U.S. M-1 tank or Bradley Infantry fighting vehicle. The T-72 is however far from out of date or a worthless combat system. The T-72 provides significant capabilities and may be maintained in the inventories of most current using nations through the end of this decade. Several arms manufacturers provide refit kits for modernization and product improvements. Line production of the T-72 tank continues today in the Czech Republic. This tank is now on the secondary arms market and will become less expensive and more widely available as user nations replace earlier models or upgrade their forces (Military Analysis Network, 2000).

Studies from recent operations and observing on-going events around the world indicated that two options for the OPFOR would be appropriate: a light insurgent Infantry-based force that is primarily dismounted; and a mounted, more heavily armed mechanized-based force. A light Infantry-based force best approximates the military forces of developing nations with limited resources, tribal or religious groups, and armed political factions. These forces are based on the most readily available equipment, resources, and manpower; they are typically reinforced by technologies procurable from the international arms market and unconventional weapons such as improvised explosive devices. Aviation systems, artillery, and older model armored vehicles are readily available. Additionally, cargo trucks, light pickup trucks and sport-utility vehicles are routinely outfitted with heavy machine guns and portable anti-armor weapons. These vehicles provide "technical vehicles" to support the lighter Infantry forces with increased mobility and firepower.

Wealthier developing nations have and, for the foreseeable future, will provide a lucrative market for excess heavy weapons. Sources include the FSU, her former Eastern European allies, rogue nations in search of hard currency, international arms manufacturers, and the U. S. foreign

policy initiatives. Mechanized-based forces, on at least a small scale, can be equipped and maintained by all but the poorest developing nations and armed factions. Their equipment might include older model tanks, armored personnel carriers, and even self-propelled artillery systems.

These two OPFOR models are representative of the OPFOR that U. S. forces might encounter while operating in the enemy's rear area or in an asymmetric environment in most present and near-term future conflicts. The U. S. Army Intelligence Center and School, as well as other agencies, develop and provide different OPFOR structure variations for use by government organizations. For this project, both a light Infantry-based force and a mechanized-based threat force models were available (U.S. Army Infantry School, 2002; DA, 1996, 1997). With minor adjustments for this specific project, these models served as the basis for the OPFOR represented in the scenario tool set.

Selecting an Operational Area

While the threat or OPFOR is a critical component of the COE, current and future forces will operate in diverse areas of operations (AO). Each AO will contain unique variations in terrain and vegetation; will most likely include varied forms of urban areas; will present different climates; and, last but not least, will present an indigenous civilian population that is quite varied in different regions of the world. Consequently, it was determined that the scenario tool set should contain two or more different regions. Selection of an AO for the scenarios focused on the availability of critical resources to support planning and execution of tactical missions. These critical resources were the availability of:

- current military map coverage, and aerial imagery of all or critical areas,
- urban terrain within the AO,
- information on the military characteristics of the terrain, beyond a mere map study, and
- light data and climatology.

Locating available current imagery to match with available military map coverage for two different geographic regions was difficult. Sufficient imagery was located for two regions: Fort Benning, Georgia and Ft. Irwin, California. A CD-ROM with near-current imagery of the Fort Benning Military Reservation was located. Imagery from unmanned aerial vehicle testing at the McKenna Military Operations in Urban Terrain training site was located to supplement the color overhead images. Fort Benning provides an AO that is characterized by relatively heavy vegetation, rolling hills, intermittent streams, and a simulated urban area. This was considered similar to many regions in Europe. Similar overhead imagery was located for Fort Irwin. Fort Irwin is a desert region that is quite comparable to the Middle East region of the world. Map coverage of both military facilities was available through Army supply channels and stocks on-hand.

Identifying Other Critical Scenario Factors

Other factors are critical to the development of a well-grounded scenario tool set that can be used with a variety of target populations and to evaluate the impact of differing key elements, such as organizational force structure and system capabilities.

Civilians on the battlefield (COB). Interaction and communications with the local population and civilians on the battlefield (COB) are critical components of the COE (CALL, 2003). The platoon leader or company commander could have direct contact with COB. Depending on the battlefield circumstances, the leader could receive information through his subordinates and sometimes through his commander, peers, or higher headquarters staff. Therefore, for the purposes of this scenario tool set, the influences of contacts with civilians are made possible via third-person role players or through scenario events. This allows observation and evaluation of leader actions, orders, and guidance.

Geographic features, weather, and light data. Geographic features, manmade structures, light, and weather data become critical in shaping the mission environment. These factors frame and provide context for the mission and required actions. The leader must consider and deal with the impact that these factors have on his unit. For example, light and weather have an impact on visibility, trafficability, the Soldiers and their equipment, and may enhance or degrade the effects of chemical agents or smoke. Prolonged darkness, cool temperatures, and rain in combination can have a significant impact on the unit's ability to accomplish its mission. Reliance on night vision systems increases and unaided vision will be reduced. Cross-country movements will be slowed as traction decreases, and swollen stream crossings may present formidable obstacles. The darkness and rain increase fatigue and reduce the comfort factors for Soldiers. Reliability of weapons or electronic equipment may be reduced by dampness. Equipment design specifications can be challenged by the anticipated circumstances or the environmental elements. The effects of smoke may linger in low areas and obscure obstacles, enemy activity, or other aspects of the operation. The geographic features, manmade structures, and the light and weather data provide the backdrop and setting for operating conditions during the mission.

Two levels of leaders, company and platoon. Another critical factor in the scenario tool set was to identify the level of leader. Based on the original intent of the project and confirmed by lessons learned from on-going real world operations, Company Commanders and Platoon Leaders were selected as the focus for the scenario tool set. Experience and observations indicate that success on future battlefields rests primarily in the hands of these leaders (Macgregor, 2004). Company commanders and platoon leaders must have certain skills and attributes to be effective.

First, they must have a passing proficiency at operating their command, control, and intelligence (C^2I) systems and displays. For today's leaders, those C^2I systems and displays are voice radios and map graphics, usually hand drawn and manually posted. These systems may be supplemented by the same C^2I means used by the U.S. Army since the bridge at Concord: pyrotechnics, hand-and-arm signals, messengers, voice commands, and reports. In the future, these systems will be supplemented or replaced by sophisticated digital systems providing digital messaging and situational awareness displays to support both planning and execution.

Next, since these leaders have only limited or no staff to assist with C^2I related duties, they must rely on their own skills for planning, developing orders, supervising mission execution, tracking the flow of the battle, and reacting to changes. Both leaders might be

assisted in planning and executing indirect fires by a forward observer or a fire support officer. Both may be assisted by their senior non-commissioned officers, either First Sergeant or Platoon Sergeant, possibly by a radiotelephone operator or vehicle driver, and the company commander might be assisted by his Executive Officer. The planning process, garnering and interpreting situational awareness, issuing orders, and providing guidance in response to changes, however, rest solely on the leader.

Finally, both leaders make decisions based on their awareness through personal observations and reports. At the battalion/task force level and above, commanders are more heavily influenced by reports from others; either subordinate or adjacent units, or from higher headquarters. While commanders at all levels attempt to be at or observe the "point of decision" during an engagement or battle, the size of their AO and activities in the AO require them to rely heavily on reports from others. The number of sources, quantity of information displays, and reliance on systems or staff to provide accurate information increases with each higher echelon of headquarters. It is at the company and platoon level where the leaders must be able to personally "observe" activities and assess the situation. Therefore, the impact of the information provided by digital systems will have the greatest immediate impact in training and techniques for company commanders and platoon leaders.

Type of mission. Offensive operations were selected for all scenarios. Digital systems bring enhanced capabilities to the battlefield not available to current forces. Through the common operational picture (COP), leaders and commanders will have improved awareness of their own unit situation, status, and subordinate locations. They will be more aware of the status of adjacent units and higher headquarters. This "blue force tracking" capability should reduce uncertainties and reliance on routine verbal reports. Additionally, the COP will include a far more refined picture of the current enemy situation, obstacles, and hazards. The combination of information provided by the COP should provide leaders the ability to avoid enemy strengths and reduce the vulnerability of friendly forces while exploiting enemy weaknesses and retaining the freedom to maneuver. These factors should combine to provide a synergistic effect as leaders take full advantage of the capabilities of new weapons and equipment while avoiding enemy fires and effects. This improved awareness should permit a leader to employ his own capabilities to gain maneuver advantage and direct his fires accurately against enemy weakness. These enhanced capabilities are best displayed and examined through offensive actions.

Types of targets. The offensive scenario missions satisfied, in part, the requirements to exercise leader awareness. However, the scenarios needed to have other characteristics to permit the situations to be adaptable and to permit stressing aspects of situational awareness. All scenarios were developed around operations behind enemy lines, increasing uncertainty and potential enemy actions and reactions to the friendly unit attack and incursion. The targets or objectives needed to be high-value in nature, a site or facility with value to capture intact versus destruction from the effects of long-range fires or air strikes. Additionally, the site must have a value to the enemy that makes it worth defending to prevent loss and worth expeditious recapture if lost. Several targets were considered. An airfield and a secluded logistics support base were selected because they satisfied the high-value target requirement and because they fit existing terrain locations. In addition, the target sites needed to be located so as to provide realistic travel time for both friendly and OPFOR units. The targets also needed to present a typical situation

that U. S. forces might encounter. Targets needed to present a challenge to the leader and require that he coordinate execution by subordinate elements to assure mission success.

Results

Selecting and Packaging Scenario Components

Based on the determined requirements, materials for scenario tools were selected, refined, or developed. These materials provide the leader with realistic orders including associated written and graphic products. Materials were selected and packaged to permit the evaluator or researcher to select the desired environment. These products should require no further tailoring to provide the definable factors to aid understanding of the situation and mission. The scenario set provides operations orders and supporting graphics. The definable factors of the scenarios are the same six key factors that commanders and leaders use to visualize and assess the battlefield. These key factors are: Mission, Enemy, Terrain and weather, Troops and support available, Time available, and Civilian considerations (METT-TC) (DA, 2001). The factors of METT-TC became the variable factors to define each scenario.

Terrain

Terrain was selected first. As indicated previously, diverse locations were desired to provide the needed variations for missions. The selection criteria for locations were critical more for the resources available to support planning and execution than the locations themselves. Variations in mission environmental conditions are attained by using actual terrain and weather from the deserts of the West and the woodlands of the Southeast. The mission areas of operation are the National Training Center (NTC) at Fort Irwin, California and the military training area at Fort Benning, Georgia. A description of the vegetation, ecological environment, and wildlife for each AO was available (Ecological Sub-regions of California, 2002; Engstrom, Kirkman, & Mitchell, 2002). These documents were used as the basis for terrain information and were edited to provide the desired focus for the scenario tool set.

Each analysis of the terrain provides an explanation of the military aspects of the terrain and wildlife in that area. Military aspects of terrain are presented in the format commonly used by planners in assessing an AO. These aspects include: observation and fields of fire; cover and concealment; obstacles; key terrain features; and, avenues of approach (DA, 1994). The analysis then discusses the effects of these various military aspects on the enemy and friendly possible courses of action to attack or defend. One of the analyses is provided at Appendix B.

In addition to the terrain analysis, a modified combined obstacles overlay (MCOO) was developed and drawn onto an overlay and placed on a map board. A MCOO is a graphical representation that depicts the battlefield's effects on military operations. It normally displays obstacles to mobility, mobility corridors, defensible terrain, likely enemy engagement areas, and key terrain (DA, 1994). The combination of the descriptive terrain analysis and the MCOO provide the necessary background on the AO and serve as planning references for the mission.

Detailed light and weather data extremes from the mid-summer and mid-winter months were acquired for both locations (Fort Benning, Georgia – Solar and Lunar Event Tables, 2003; Solar and Lunar Event Table, 2002; Weather and Climate-Georgia, 2002). While current light and weather conditions for most regions of the world are readily available from multiple sources, the intent of the scenario set was to provide an on-hand reference for the ease of the user. The winter and summer data points were selected to represent the typical extremes. A note is included in each table set that advises the evaluator or researcher how the light and weather data information can be altered to assist in creating the desired battlefield conditions. A sample of the light and weather data is at Appendix C.

For both areas, current military map coverage and imagery were available. To enhance mission planning overhead imagery of the objective areas was obtained (a sample is provided at Appendix D). To confound any foreknowledge that participants may have of the selected AO and to create the desired target area, certain alterations were made to the imagery. For scenario purposes, some modifications supplement existing physical characteristics and introduce or alter man-made facilities. The overhead imagery provides the leader details needed for planning.

Mission

The **M**issions were defined by a series of carefully crafted operations orders (OPORDs). A sample OPORD is at Appendix E. The general situation of all scenarios is similar. The unit, platoon or company, is operating as a subordinate of its parent organization, on a non-contiguous battlefield, in a Brigade AO. The operation takes place behind the enemy's forward line of own troops, adding an increased element of risk. All missions are similar in that the offensive operations are in support of a major attack by friendly forces and are out of support range of the major friendly force. Two basic offensive missions were designed:

- secure an airfield, "temporarily" disable aircraft, and search for specialized equipment, and
- secure a logistics site, which includes securing captured materials for destruction or turnover to partisans.

A series of battalion-level OPORDs were developed for company commanders, and a series of company-level OPORDs were developed for platoon leaders. All missions require coordination with adjacent units and assignment of tasks to subordinate elements. To create flexibility through scenario events, the success of all missions and the overall security of the unit are dependent on parent organization and adjacent unit success. Each OPORD was carefully crafted, reviewed, war-gamed, and edited to assure the similarity of required tasks, parallel complexity of missions, and operational timing. This allows each mission to be affected by a common framework of events that can be altered, as desired. A list of potential optional events was developed (an extract is provided at Appendix F). These various events may be injected in any scenario to introduce challenges for the leader, to increase mission complexity, or to assess how leaders might respond to a situation when they are equipped with different technologies.

Troops and Support Available

To provide the variations required for analyzing the impact unit organization and technologies have on the leader, three organizational units were developed to support the scenarios. These unit sets provide the Troops. The first unit is a current force, light Infantry battalion. This force, configured without digital equipment, is patterned after a typical active or reserve component Infantry unit found in the preponderance of the U. S. Army force structure today. The second unit is from a Stryker Brigade Combat Team (SBCT). Previously referred to as the intermediate force, the SBCT element provides increased mobility, digital messaging, as well as improved visual displays and situational awareness for leaders. The third force available in the scenarios is a Future Force organization. The Future Force is modeled after the information on force structure, organization, and equipment currently available through the FFW and FCS programs. This force would make available to the leader improved communications, netted fires, robotic support and advanced reconnaissance systems. A sample of the force structure information is contained at Appendix G.

To add realism, biographies for selected key leaders were developed. These biographies will assist the designated unit leader in determining the personalities of subordinates, peers, and superiors as well as making assessments of unit capabilities and limitations. Appendix H provides an extract from one of the biographical documents.

Time Available

Each mission scenario was developed to present the leader with unit movements, supporting unit missions, and coordinating tasks that present significant challenges to the Time available for mission execution. As described above, a basic events list and optional events are also provided (Appendix F). These optional scenario events may be inserted to ease situations or further complicate time as an essential factor. If desired, the simulated mission execution can be compressed or the scenario can be modified to start at a designated scenario time, event, or location.

Since leaders will develop their own plans and can set the pace of the operation, the scenario tool sets could not fully quantify all scenario related times. A key aspect of the scenarios is the allocation of sufficient real-time, not scenario related time, for the evaluated leader to prepare and plan. Evaluation of future systems, for example, may require training in special skills and/or equipment. Planning will require receiving the OPORD, reviewing the associated materials, planning and drafting an order for his own unit, briefing subordinates, and could include a limited rehearsal to clarify the leader intentions and orders. Depending on the background knowledge and experience of the leader, rough estimates indicate that one to three hours should be allocated for leader planning. Special skill or equipment training, when required, should include recommendations for employment and allow the leader sufficient practice to develop the needed proficiencies. Time required for training will depend on the skill of each leader and the new technologies that might be injected into the scenario. This amount of time has not been determined but is an essential consideration when planning an evaluation.

Enemy

The Enemy situation and type of enemy force was designed for all scenarios. Two types of OPFOR are available:

- a light Infantry-based force, and
- a mechanized-based force.

The light Infantry force is structured along the framework found in FM 100-63, *Infantry-Based Opposing Force: Organization Guide* (DA, 1996). The enemy force includes irregular Infantry elements and units equipped with "technical" support vehicles. A developing nation mechanized-base force is also available. This heavier force has units structured along the framework found in FM 100-60 *Armor- and Mechanized-Based Opposing Force: Organization Guide* (DA, 1997). The intelligence situation for each type of OPFOR depicts the forces as predictable though adaptive. This document provides the general and special situation and parallels the information depicted on the Enemy Situation Overlay on each map board. Enemy fire support and reinforcing units are positioned to have the capability to influence the friendly mission. A sample of an intelligence situation is provided at Appendix I. All missions take place behind enemy lines.

Civilian Considerations

Scenario events and rules of engagement (ROE) were developed to provide Civilian considerations for all scenarios. The ROE provide constraints on the mission, such as limiting offensive fires and restricting some maneuver. The ROE are contained in the OPORD for each mission (Appendix E). Scenario events are crafted to challenge or distract the leader by the appearance of civilians and/or having subordinate elements make contact with civilians during mission execution.

Other Supporting Materials

To supplement the scenario components described above, other materials were created to assist the leader with understanding and executing the various missions. Also, a tool to aid users of this scenario tool set is available.

Map boards. Four map boards were developed to support user understanding, planning, and execution. Each map board provides a base map of 1:50,000 scale for planning. There are two NTC map boards and two for Fort Benning. Each map board provides variations in the enemy situation. Each map board has an enemy situation overlay to depict enemy dispositions and a MCOO to supplement the written terrain analysis. Additionally, operations graphics associated with the higher headquarters OPORD are provided for each mission.

Each map board contains a blank overlay for leader planning. The leader may use this overlay for development of supplemental graphic control measures, for fires/effects planning, or for other graphics required to support his tactical plan. This map board with overlays can be used to brief subordinates or designated role players.

Consolidated incident list. As mentioned above a list of basic events, or a master incident list, was developed to support mission execution and to stimulate leader supplemental orders and actions. The incident list contains two categories of events. Master incidents are designed to drive the basic actions required to execute the mission. Optional events are listed in a general sequence that corresponds to the expected flow of the operation. These optional events are designed to create varied incidents in the scenario and can be introduced by the exercise controller/evaluator to cause the leader to react. These optional events may be interjected to support the requirements of the evaluation or desired training objectives, as well as to present challenges to the leader. Potential consequences are identified for the events to assist the evaluator in determining which events to select. An extract from this list is provided at Appendix F.

Electronic files. To assist users in preparing documents for leaders, copies of files for all resource documents to administer the scenarios are catalogued in two volumes based on geographic location, NTC or Fort Benning. A sample of the Table of Contents for each volume listing the components of the scenario tool set is provided in Appendix J.

User's manual. The final supplemental tool is a User's Manual. Because some users of the scenario tool set might not be familiar with military operations or the reference sources that leaders typically use for planning an operation, the manual is intended to provide a "How To" guide. The Manual was also designed to assist researchers and trainers in selecting the appropriate components and assembling exercise scenarios to facilitate the objectives of their study, evaluation, and/or training event. Users are guided through the component selection process to tailor the scenario materials to create the desired events, conditions, and circumstances that permit their efforts to focus on the leader skills to be examined. A list of considerations is provided to assist in the selection of scenario components. A key section of the manual provides a step-by-step example of how to customize the scenarios to meet a hypothetical situation. This section of the User's Manual is provided at Appendix K. As a further aid to scenario tool set users, the manual provides a guide on time management, providing an estimated time to complete the various aspects of scenario execution. Following the recommended sequence in the manual allows users to plan, prepare, and execute the missions in the scenario tool set.

Product Overview

The scenario tool set provides a repository of components available for multiple applications. These components permit the assembly of scenarios for a wide variety of specific aspects of leader performance and training. They provide the evaluator or researcher with "plug and play" components that can be tailored to evaluate specific factors in areas such as new technologies or changes in unit organization. Scenarios can be assembled with limited effort to produce 48 scenario base options for the company commander and 48 for the platoon leader. These base options can be further varied through the insertion of events from the optional master incident list during the mission. Table 1 shows the multiple factors that can be combined to create the various basic scenarios.

Table 1
Variable Scenario Factors

Mission		
Secure an airfield, disable equipment	Secure logistics site & captured material	
Enemy		
Insurgent light Infantry, primarily dismounted	Mechanized, more heavily armed Infantry	
Terrain		
Fort Benning	Fort Irwin (NTC)	
Weather / Time Data		
January	July	
Troops Available		
Current Force	Stryker Force	Future Force

The scenario tool set provides flexibility for the evaluator or researcher. While military experience would be beneficial, the tool set can be used by someone with a basic understanding of military operations, and the supporting documents used by leaders in planning for operations. Scenarios may be employed in a simple environment, like a tabletop exercise supported by a single role player. The scenarios can be conducted in a computer simulation such as JANUS, but would typically require support from two or three subordinate unit or parent unit role players/OPFOR players. The scenarios can also be conducted in the Soldier Battle Lab at Fort Benning, but would require extensive support and multiple subordinate unit, parent unit, and OPFOR role players.

To facilitate the objective of a study, evaluation, and/or training event, the scenarios may be tailored to create specifically desired events, conditions, and circumstances. The existing materials have been designed to permit a variety of military aspects to be examined. The following list of considerations should be used for planning events, setting conditions, and creating circumstances when determining which scenario components, modules, and events are available.

- Echelon of the element leader to be evaluated
    - Company
    - Platoon
- Characteristics of the enemy force desired
    - Dismounted light Infantry
    - Mounted Infantry and armor
    - Rapid reinforcement capability
    - Indirect fires against the friendly force
    - Level of resistance
    - Early detection of the friendly force
    - Nuclear, biological, chemical threat
- Terrain, light, and weather considerations
    - Long range observation or the ability to engage targets at extended ranges with direct fires
    - Exposure to or cover from direct or indirect fires

- o Concealment from observation or detection
- o Obstacles to dismounted or vehicular movement
- o Urban terrain
- Type of friendly force to be evaluated
  - o Current light Infantry element
  - o Current SBCT element
  - o Future Force element
  - o External fire support
  - o Reaction to casualties
- Civilian considerations
  - o Encounters with COB
  - o Contact with COB
  - o Reaction to requests from COB or identified needs
  - o Implementation of the ROE

Determining which criteria to use for a desired training, evaluation or research effort will guide the selection and assembly of all the critical components required to build a customized scenario. Typically, the user would select an item (e.g., a specific OPORD, or weather conditions) from each component (e.g., set of OPORDs, light and weather data) of the tool set to create the scenario. A specific example of how to build a scenario is provided in the User's Manual.

Product Applications

The scenario tool set is designed for multiple purposes. The major components of the tool set package yield 48 base scenarios. In turn, these can be modified to produce nearly 100 different scenarios by altering basic scenario events or injecting optional events to create various exercise conditions. All source documents needed for leader planning are available, to include supplemental map boards. Each can be modified to conform to the desired exercise requirements. A User's Manual containing a step-by-step guide and a specific example of how to use the scenario tool set will assist evaluators and trainers. Use of these scenarios requires advanced planning to select the modules, components, and incidents to create the desired situation. The scenarios and resulting exercise vignettes, administered in a constructive or virtual simulation, will provide a realistic representation of expected battlefield events to allow leader evaluation and training.

A potential use of the scenarios is to determine the impact of new organizations, equipment, technology, or capabilities on the skills and decision-making abilities of Infantry company commanders and platoon leaders. Critical scenario components can be altered in a controlled manner to isolate and focus on key aspects of leader performance for evaluation. For example, the scenario could present the same friendly force structure and enemy situation while varying the equipment available to the leader to accomplish a mission (e.g., analog communications, digitized systems, and robotic devices linked to multiple sensors) to determine how each of these capabilities impacts the leader's mission planning and execution.

The scenario tool set is also available to train leaders in the employment of new technologies and capabilities. Even before the actual equipment systems are developed, leaders can train with and practice operations in an exercise environment to gain an appreciation for how these new technologies and capabilities could be used on the battlefield to increase their units' combat power to enhance mission success.

This training can be accomplished in multiple situations to determine and evaluate the "what if" trade-offs of different employment options for the emerging capabilities. These trade-offs could be in the area of force structure that varies the type and quantity of systems or in how missions can be executed differently with the addition of an enhanced capability.

The researcher can use the variable elements of the scenarios to craft situations and conditions that enable evaluation of the selected aspects of leader performance. Based on the desired data sets or observations to be collected, scenarios may be defined through pre-selection of variables and options, creating definable conditions. Through these controlled conditions, the researcher can control or isolate key factors that influence the leader decision-making process. Through selected or inserted scenario items, the researcher can stimulate an observable or recordable action, response, or point of inaction/omission by the leader. Scenarios could be crafted that allow the researcher to isolate key factors from decision-making under pressure and how a leader focuses attention and processes information during key events on the battlefield, to identify what technological capabilities are preferred by leaders in different circumstances, and to determine how leaders chooses to interact with subordinates when they have various communication assets at their disposal.

The scenario tool set is ready for use in the evaluation of Future Force capabilities and technologies as well as other improvements or variations in force capabilities or design. Far from a static, one-time use package, the modular scenario components lend themselves to adaptation and tailoring for a variety of purposes and functions. Additionally, the scenario components can be modified or added to as new requirements or conditions are identified in the future. Scenario components can be updated based on information and lessons learned from real-world operations and training exercises. The scenario tool set provides a broad foundation to support current and future research and training efforts. To obtain more information about this product or to acquire a copy, contact the Infantry Forces Research Unit at Fort Benning, Georgia.

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Appendix A

List of Acronyms

AO	areas of operations
CALL	Center for Army Lessons Learned
C^2I	command, control, and intelligence
COB	civilians on the battlefield
COE	Contemporary Operating Environment
COP	common operational picture
DA	Department of the Army
FCS	Future Combat System
FFW	Future Force Warrior
FM	field manual
FSU	former Soviet Union
MCOO	modified combined obstacles overlay
METT-TC	mission, enemy, terrain and weather, troops and support available, time available, and civilian considerations
NTC	National Training Center
OIF	Operation Iraqi Freedom
OPFOR	opposing force
OPORD	operations order
ROE	rules of engagement
SBCT	Stryker Brigade Combat Team
SCORES	Scenario Oriented Recurring Evaluation System
TRADOC	U.S. Army Training and Doctrine Command
UJTL	Universal Joint Task List

Appendix B

Sample Terrain Analysis

Ft. Benning Terrain
(GT1A_1B)

1. Military Aspects of Terrain and Wildlife.

a. Observation and fields of fire: Conditions vary from excellent during late fall, winter, and early spring to poor during late spring, summer, and early fall because of the seasons and variation of the foliage. The terrain in the area of operation consists of gently rolling hills with streams and intermittent streams throughout the area. The vegetation on the high ground consists of adult pine and hard wood forest. Planted pine nurseries of 5 to 30 acres are common throughout the area. The area has an active forest management plan with controlled burning every two years that has restricted the undergrowth throughout the high ground. However, the marshy low-lying areas have very thick undergrowth that will restrict observation, fields of fire, and movement of all kind.

Most named streams begin at manmade lakes/ponds and flow southwest to the Chattahoochee River. There are numerous swamps in the low areas and adjacent to most of these streams. All streams and swamps in the area are fordable by light infantry and range from ankle to waist deep with a soft muddy bottom. These low swampy/marshy areas will restrict both friendly and enemy vehicle traffic. Dismounted movement through these areas will require additional time to maintain stealth.

b. Cover and Concealment: Cover and concealment vary as much with the seasons as do observation and fields of fire. Care should be utilized during planning to select the appropriate route depending on the season and its associated vegetation. The adult planted pine forests provide adequate cover for dismounted movement, but are lacking for ground and air concealment. The low-lying areas provide good concealment with thick undergrowth, but there is very little cover. With careful route selection the rolling hills and drainage patterns can be used to mask mounted and dismounted movement. There are numerous gorges created by rain runoff throughout the area. These gorges have near vertical sides and may range in depth from 2 feet to 60 feet.

c. Obstacles: Along with natural obstacles the terrain is very conducive for man-made obstacles canalizing the attacker. The sand and red clay soil excavates and packs well requiring little obstacle maintenance. The marshy low-lying areas will restrict vehicular movement to the higher elevations. While military wheeled or tracked vehicles can ford all streams, finding an approach to the ford may prove a challenge.

There are two railroad lines in the area of operations, Central of Georgia and Seaboard Coast Line. Both railroads enter from the northwest and exit the area to the southeast. All railroads present major challenges for lateral movement. Railroad beds consist of tennis ball size loose rock with numerous cuts and fills. The railroad maintains a 15-foot right of way on either

B-1

side of the railroad bed by using a defoliant to restrict undergrowth, creating fields of fire in excess of 2,000 meters. If crossing becomes necessary, the crossing point should be adjacent to a bend in the railroad to limit enemy observation to one direction. Caution must be exercised to insure that vehicles do not become high-centered.

    d. Key Terrain: Key terrain for this mission includes:

        1. Mc Kenna Airfield (16SGL063836) is a 1000-meter (+/-) improved, semi-developed airfield capable of supporting up to AN-12 CUB/ C-130 Hercules fixed wing aircraft. The facility consists of a hangar, one admin/maintenance/billet building, a control tower, in-ground fuel storage facilities, and extensive ramp and parking space for troop marshalling or logistics operations.
        2. Mc Kenna Village (16SGL065863), on dominant terrain and containing several multistory masonry structures, provides excellent observation of the surrounding area.
        3. High ground vicinity 16SGL067866 is a hub for routes throughout the AO.
        4. High ground vicinity 16SGL083850 is a hub for routes throughout the AO.

    e. Avenues of Approach: There is an abundance of roads and trails traversing the area. These roads and trails vary from two lane blacktops, to 30-foot wide hard packed dirt, to 8-foot wide trails of very soft sand. However, all will support military vehicular traffic.

        1. First Division Road is a light duty all weather improved dirt road approximately 30 feet wide. It should be considered a high-speed approach that traverses the area of operation from the west (vicinity railroad bridge 16SGL028860) to the north vicinity 16SGL045866, then turns to the east intersecting with Plymouth and Underwood Road vicinity 16SGL1287. In the east an unnamed road continues north as First Division Road turns east.

        2. Hourglass Road is a light duty all weather improved dirt road approximately 30 feet wide. It should be considered a high-speed approach that enters the area of operation from the southwest (16SGL0582), traverses northeast (vicinity 16SGL0985), then turns due north to Eelbeck (16SGL1191).

        3. Red Diamond Road is a light duty all weather improved dirt road approximately 30 feet wide. It should be considered a high-speed approach that enters the area of operation from the southeast and intersects with Hourglass and Buffalo Roads (vicinity 16SGL1085).

    f. Wildlife: There are several species of wildlife in the area that may affect operations. Alligators are plentiful in the area. Most ponds have several, including the beaver ponds, many of which do not appear on the map. Alligators' young hatch in the early summer and are guarded by the female. These females have been known to attack boats that come between her and her young. Sightings of 10-foot alligators are common with some reaching 18 feet.

There are herds of feral hogs in the area. These herds feed in the low lying areas, with as few as 3 or 4 to as many as 15 to 20 hogs to a herd. Hogs are aggressive and have been known to "tree" local hunters for several hours before losing interest and leaving the area. The adult

hogs are very protective of their young and will attack to protect their young. Female hogs will mate every six months having as many as 8 young in a litter, so any herd will have several young.

There are numerous coyotes in the area. Coyotes are nocturnal feeders and hunt as single animals; but when prey is found, the entire pack assembles for the kill.

There are several species of snakes in the area. However, only three are poisonous. The Cain Break Rattlesnake has a brown body with dark brown and black markings along it's back. It will grow to 5 feet in length and be as big around as a man's forearm. The Copperhead is also a brown bodied snake with dark brown markings along it's back. However, the Copperhead rarely reaches 18 inches in length and is normally as big around as a man's thumb. Both the Cain Break and Copperhead range the high ground and prefer rotting stumps and logs as hiding places. The Water Moccasin (Cottonmouth) is a grayish-bodied snake with dark gray to black markings along it's back. It will grow to 4 feet and be as big around as a man's forearm giving it a short and fat look. As the name indicates the Water Moccasin prefers water and will bite underwater. All three snakes' venom will render a healthy man deathly sick and may kill small children. If bitten, the individual should be evacuated as soon as the situation permits.

2. Effect on Enemy Courses of Action:

a. Attack: Motorized forces will have approach avenues limited only by water/swamp obstacles and rapid employments will be limited to the high ground and road network. Dismounted troops can negotiate the entire area of operations, although additional time will be required to navigate the swampy areas.

b. Defend: Defensive perimeters must provide 360^0 coverage. This will cause thinning the lines or smaller perimeters. The enemy has chosen to rely on rapid reaction forces for supporting their out-lying forces. The reaction force will attempt to reinforce defenses or engage any attacking force from the flank or rear, forcing the attacking force to fight on two fronts or to disengage.

3. Effect on Own Courses of Action:

a. Attack: As with the enemy, the terrain provides unlimited avenues of approach for dismounted infantry. Stealth and speed during the approach will assist in maintaining surprise. Caution must be used when selecting approach routes to avoid observation and possible engagement from the rear by the mobile mounted forces. A successful plan must include minimal exposure in the objective area and disruption or destruction of enemy reaction forces.

b. Defend: Once enemy forces in the objective area are defeated, the initial threat will come from reaction forces approaching along the high-speed routes. Extended occupation of the objective areas increase the probability of both infantry attacks and the likelihood of a major mounted force attack. Any withdrawal route should limit the enemy's vehicle pursuit by keeping a water obstacle between your forces and a high-speed avenue of approach.

Appendix C

Sample Light and Weather Data

Light Data for Ft. Benning

2A (Ft. Benning 12 January)

	12 January	13 January
Sunrise		0742
Sunset	1754	
Moonrise	1331	
Moonset		0128
Moon Phase	3/4	
% Illumination	64%	
BMNT		0642
EENT	1854	

2B (Ft. Benning 12 July)

	12 July	13 July
Sunrise		0542
Sunset	2001	
Moonrise	1915	
Moonset		0409
Moon Phase	1/4	
% Illumination	16%	
BMNT		0440
EENT	2051	

Note: The factors listed in these tables can be modified to provide/create a situation that would require/restrict the use/employment of desired capabilities. Some examples include:

1. Decrease the % illumination and conduct an operation at night to force more dependency on sensors and optics for situations with reduced visibility.

2. From the weather section, include late night/early morning rain showers that will likely delay the actual illumination effects so the impact of sunrise will be later than shown in the table.

Weather Data for Ft. Benning

2A (Ft. Benning 12 January)

High	56^0
Low	35^0
Wind	10 mph
Direction	Out of SE
Rain Showers	20 % PM

2B (Ft. Benning 12 July)

High	91^0
Low	71^0
Wind	20 mph
Direction	Out of SW
Rain Showers	20 % PM

Note: The factors listed in these tables can be modified to provide/create a situation that would require/restrict the use/employment of desired capabilities. Some examples include:

1. Changing the wind direction and speed would impact decisions to employ obscurants (smoke) (when/where used to create the required impact) and possibly the effectiveness of an unmanned aerial vehicle (UAV).

2. Increasing rain showers or having prolonged rain could make certain areas of the terrain impassable by mounted forces or restrict the use of an unmanned ground vehicle (UGV).

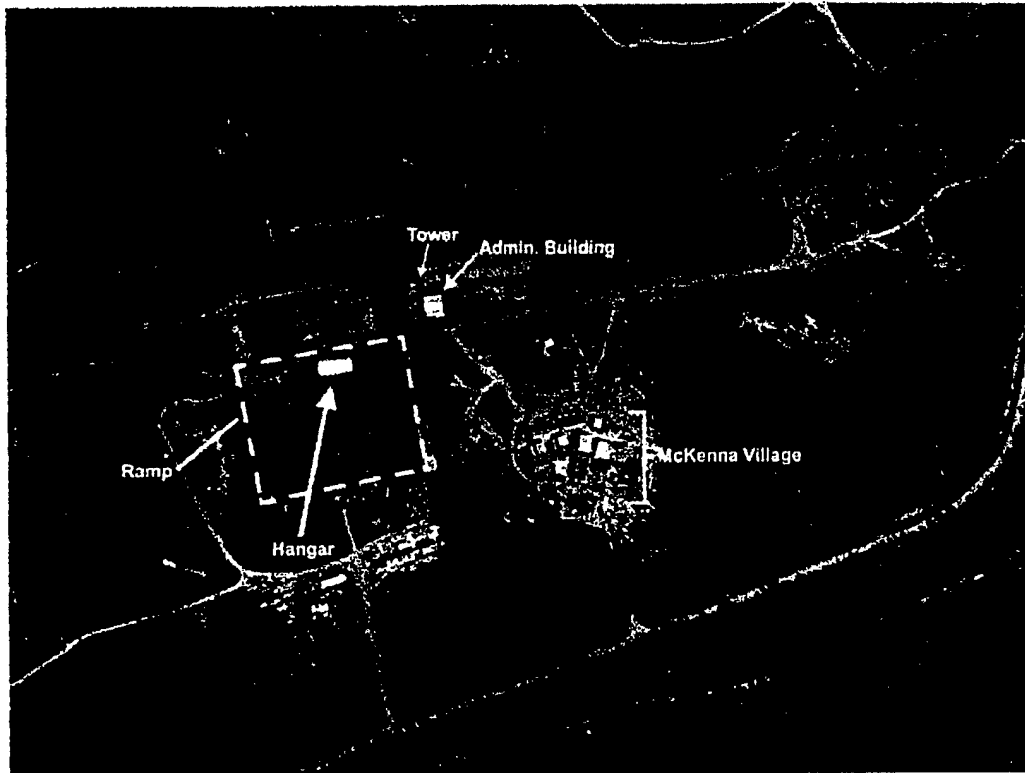# Appendix D

Sample Overhead Imagery

Figure D-1. Airfield at Fort Benning.

Figure D-2. UAV image of Fort Benning airfield.

Appendix E

Sample OPORD

OPERATION ORDER (OPORD)
GO1B1

[Company Order Ft. Benning (McKenna Airfield) Mission Indigenous Enemy]

1. SITUATION.

a. Enemy: See separate handouts for enemy situation, terrain, and weather information.

b. Friendly:

1) ( ) Brigade ( ) executes offensive operations against enemy forces in AO MARK west of Columbus to disrupt supply and support operations, isolate JTF 626 objectives, and deny the enemy freedom of movement.

2) (-) INF BN will move to and secure McKenna Airfield vicinity 16SGL0683 and deny the enemy access to the airfield and critical resources.

3) B Co attacks and secures OBJ ROCK (16SGL055829) and establishes a blocking position to prevent enemy approach from the southwest.

4) C Co is the battalion reserve and follows A Co. C Co is prepared in priority to assume the A Co mission, reinforce B Co, or establish a blocking position vicinity check point 6 (16SGL054856) or vicinity check point 3 (16SGL084849) to deny enemy forces from approaching OBJ BETWEEN.

2. MISSION. (___unit_____) will attack and secure McKenna Airfield vicinity 16SGL0683 NLT 0400 (_____) to deny the Gordonian Army's La Ban Militia access to the airfield and render all aircraft on site temporarily inoperable and destroy the laser alignment device.

3. EXECUTION.

Intent: My intent is to move quickly and employ surprise. We will allow B Co to initiate their supporting attack to draw the enemy's reaction, then seize the McKenna Airfield. Our initial focus will be to secure the buildings and facilities. We will employ a platoon reserve to block enemy elements out of the B Co sector or deal with unexpected threats from McKenna that attempt to reinforce the enemy, disrupt our mission, or counterattack. We will consolidate rapidly and secure the airfield, rendering any aircraft onsite <u>TEMPORARILY</u> inoperable and destroying the CUDO laser alignment device. Available fires will be employed to destroy the enemy's ability to react or, if we are compromised early, to destroy advancing counter attack forces before they can influence our mission.

a. Concept of operations:

1) Maneuver: The Company will be second in the order of movement following B Co and move to an assault position vicinity 16SGL065844 to await the securing of OBJ ROCK vicinity 16SGL054833. Our supporting attack will be to seize the tower/admin building area (16SGL064836) on the company's left. The main effort will be to seize the hangar and aircraft ramp area (16SGL062835).

2) Fires: Priority of fires will go to 2nd Platoon initially, then to 3rd Platoon if committed. The battalion has 2 x F-18's with a total of 8 laser guided MK81 500lb bombs on station vicinity Pine Mountain, GA beginning at 0100 until 0430. Reaction time to the area is 4 minutes. Fires will be directed against the concentration of technical vehicles vicinity 16SGL057827 when ground contact is initiated or our attack is discovered or movement compromised. Priority targets: technical vehicles and infantry concentrations in that order.

b. Tasks to maneuver units:

1) 1st Platoon will conduct the supporting attack on the company left against the tower/admin area (16SGL064836). Maintain contact with 2nd Platoon and control your fires. Maintain a squad reserve initially until we see if a fight develops. Render any aircraft on the eastern portion of the airfield temporarily inoperable. You are first in order of the company movement. Consolidate the perimeter from 2 to 6. Use your best marksmen to scan McKenna village; you have the most dangerous sector with the potential for mounted, dismounted, and sniper threats from McKenna or the left flank.

2) 2nd Platoon will conduct the main effort on the company right and will secure the large hangar and any aircraft on the parking ramp. Move quickly, but do not loose control. Maintain contact with B Co and 1st Platoon. You are second in order of company movement. Consolidate the perimeter from 6 to 9, but tie in and coordinate fires with B Co. You're second in the order of movement.

3) 3rd Platoon will be the company reserve and follow 2nd Platoon. Keep your element out of small arms range and be prepared to assist 2nd Platoon or assume their mission. You have potential to be the least engaged platoon, however if either B Co or 2nd Platoon has problems you can become involved quickly. Focus on the right, however, if threats develop from McKenna Village or our left flank is threatened, you may be committed on east. Consolidate from 9 to 2.

4) Mortars move with 1st Platoon. Support from the assault position vicinity 16SGL065844 initially, then move by echelon to vicinity 16SGL063837.

c. Coordinating instructions:

1) Commanders Critical Information Requirements (CCIR):

(a) Priority Intelligence Requirements (PIR):

-Will Gordonian forces reinforce the McKenna Airfield or the Depot? If so, when and with what forces?

-Will the enemy disperse or move the armor and technical vehicles located at GL057827? If so, when and to what location(s)?

    (b) Essential Elements of Friendly Information (EEFI):
        -The time of our attack, routes, and location of our objectives.

2) Rules OF Engagement (ROE):

    (a) No small arms will be fired within or into the built-up area of McKenna without positive identification of a hostile target.

    (b) No indirect fires larger than 81-mm may be used within 150-meters of McKenna.

    (c) Detain and report any civilians encountered along movement routes. Civilians will be released on my order after the mission is completed.

3) Disable aircraft by removing valve stems to deflate tires and place chains and locks on tail rotors of helicopters.

4) Control fires into and toward McKenna Village. Observe the ROE. Report observed or suspected enemy activity in the Village ASAP.

4. SERVICE SUPPORT.

a. Medical evacuation: Aerial MEDEVAC is available with a 20-min reaction time. Establish MEDEVAC PZ/LZs away from troop concentrations to avoid compromise and targeting.

b. Supply: Classes I, V, and VIII are available on site for immediate supplemental draw. Emergency resupply only will be available until 1600 hours tomorrow.

5. COMMAND AND SIGNAL.

a. Command:

1) Command Group will move with 2nd Platoon initially.

2) Succession of command is XO, 2nd PL, and 1st PL.

b. Signal:

1) SOI in effect.

2) Challenge and password: DOOLITTLE---FISH

3) Code words for this operation:

    (a) Airfield secure: BINGO
    (b) Number combination: 11
    (c) Running password: GONE HUNTING

4) Pyrotechnics and visual signals for this operation:

    (a) Green Star Cluster-- Withdrawing under pressure
    (b) White Star Cluster-- Need assistance
    (c) White Parachute Flare-- Need MEDEVAC
    (d) Red Star Cluster—Lift/ shift fires

Appendix F

Extract from Consolidated Incident List

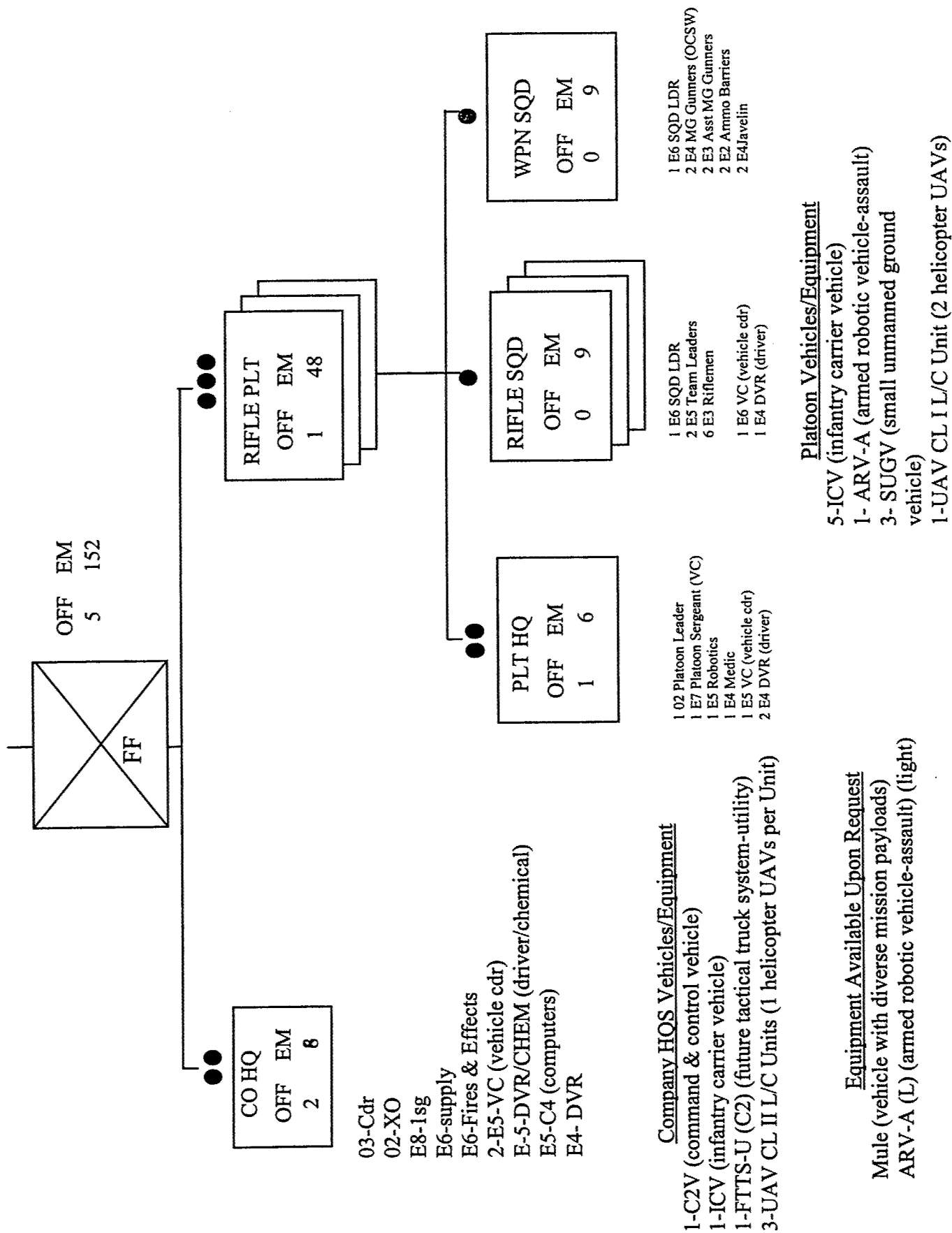**Consolidated Incident List for Company/ Platoon Operations**

Master column provides a framework to drive the scenario. Incidents in the **optional** column may be inserted to gauge leader responses. **Potential consequences/notes** lists possible outcomes of the incident and suggestions for when to use this particular incident. This incident list is the master framework to drive the scenario. It should be supplemented by routine SITREPs and progress reports from the subordinate leaders.

Movement		
Master	**Optional**	**Potential Consequence/Notes**
	___ % (=/< 25%) of unit internal commo (radio/LW/FBCB2/GPS) systems inoperable at start of mission	1. No commo w/ ___% of unit 2. No SA with ___% of unit (GPS locations, etc.) 3. Leader should direct the redistribution of resources.
Higher Cdr informs Cdr/ Leader that lead element crossing LD		
Higher Cdr directs Cdr/Leader to initiate movement.		
	Preceding Co in movement reports estimated 8 personnel, moving south, in combat formation, vicinity a recognizable terrain feature/control measure, dressed as civilians, carrying small arms	React to a potential threat.
	Enemy patrol sighted by subordinate element (can vary the location).	1. Could be armed personnel reported previously. 2. Additional enemy in AO not previously reported. 3. Subsequent reports should be rendered.
	Break in contact with a subordinate element	1. If leader does not reestablish contact, element remains lost for duration of scenario. 2. If leader takes steps to reestablish contact, elements links-up and scenario continues.

Appendix G

Sample Friendly Force Structure Chart

Future Force Organization

FF

OFF 5   EM 152

CO HQ

OFF	EM
2	8

O3-Cdr
O2-XO
E8-1sg
E6-supply
E6-Fires & Effects
2-E5-VC (vehicle cdr)
E-5-DVR/CHEM (driver/chemical)
E5-C4 (computers)
E4- DVR

RIFLE PLT

OFF	EM
1	48

PLT HQ

OFF	EM
1	6

1 O2 Platoon Leader
1 E7 Platoon Sergeant (VC)
1 E5 Robotics
1 E4 Medic
1 E5 VC (vehicle cdr)
2 E4 DVR (driver)

WPN SQD

OFF	EM
0	9

1 E6 SQD LDR
2 E4 MG Gunners (OCSW)
2 E3 Asst MG Gunners
2 E2 Ammo Barriers
2 E4Javelin

RIFLE SQD

OFF	EM
0	9

1 E6 SQD LDR
2 E5 Team Leaders
6 E3 Riflemen
1 E6 VC (vehicle cdr)
1 E4 DVR (driver)

Company HQS Vehicles/Equipment
1-C2V (command & control vehicle)
1-ICV (infantry carrier vehicle)
1-FTTS-U (C2) (future tactical truck system-utility)
3-UAV CL II L/C Units (1 helicopter UAVs per Unit)

Platoon Vehicles/Equipment
5-ICV (infantry carrier vehicle)
1- ARV-A (armed robotic vehicle-assault)
3- SUGV (small unmanned ground vehicle)
1-UAV CL I L/C Unit (2 helicopter UAVs)

Equipment Available Upon Request
Mule (vehicle with diverse mission payloads)
ARV-A (L) (armed robotic vehicle-assault) (light)

Appendix H

Sample Biographies

BIOGRAPHIES

<u>**Personnel for the Company OPORD**</u>

<u>Battalion Commander</u>
      Newly assigned because of last commander's recent injury, he is a graduate of West Point and was selected for battalion command ahead of his peers. He is 36 years old, unmarried, and focuses solely on his career. He commanded a Ranger company and has served as the G3 Plans Officer and Battalion S3 in the 82nd Airborne Division. He has a quick temper, but after he vents there is no grudge.

<u>Battalion S-3</u>
      He has been married 17 years and has 4 children. He has been the S-3 for nine (9) months. He has been on active duty for 18 years (13 commissioned and 5 enlisted). He tries his best to be the much-needed buffer between the BN Commander and the company commanders.

<u>B Company Commander</u>
      This hard charging bachelor loves football and rugby. He was a lieutenant in the 75th Ranger Regiment. His initial assignment in the Battalion was as the S3 Air where he served for a year. He has been in command for 3 months. His NCOs think that he volunteers the unit for too much, but they admire his tactical skills and physical fitness.

<u>C Company Commander</u>
      An "old man" of the Battalion, he was near the end of his company command when the battalion was alerted; was quickly extended. With 6 years of enlisted service, he is seasoned and mature. His 18 months as the S4 had a positive impact on the battalion and earned him the respect of his peers. His slow responses often frustrate the Battalion Commander. He is respected for his ability to read the situation and his love and use of supporting fires.

<u>A Company 1SG</u>
      He has been on active duty for 17 years and has been the 1SG for two (2) years. He is an excellent field Soldier, but is lacking in garrison responsibilities. The Soldiers not only respect him, but also like him; he is a young Soldier's role model.

<u>1st Platoon</u>
      The platoon leader was assigned 30 days before this deployment and has limited field time with this unit. The PSG has been with this unit for 5 years and has been the PSG for the last 1½ years. He was recently promoted to SFC. The platoon, as a unit, has done well in the field in the past, however, the new PL is untested at this time.

2nd Platoon

Solid as a rock, the PL and PSG work very well together. Because of this fact, they are normally the lead platoon for the company and consequently have sustained casualties leaving them undermanned. However, this does not deter them; they feel slighted if another platoon is selected to lead.

3rd Platoon

Middle of the road performers, the PL and PSG get along only because they have to. They are content to let 2nd get all the glory and take casualties. The platoon can be counted on, but will never volunteer for the difficult tasks.

Mortar Platoon / Section

The platoon is without a PL. The NCOIC has the best mortar evaluation in the Battalion. They have won every Brigade mortar competition for the past three (3) years.

STRYKER ONLY MGS (Mobile Gun System) Platoon (9 personnel)

Senior PL with a previous assignment to Korea with a light infantry unit. He has been assigned for two (2) weeks. Your first impression is a good one.

Sample Intelligence Situation

Indigenous Enemy Situation for Ft. Benning Missions
(GE1 and 2A)

U. S. Joint Task Force (JTF) 626 (10th Corps) continues to conduct offensive operations against Gordonian's Army, La Ban Militia, and a loose Confederation of War Lords loyal to La Ban. JTF 626 and the Combined Allied Force supporting the Gordon Liberation Union are preparing to conduct a major offensive. This single envelopment of the 5th Gordonian Division will seize the critical rail and river transportation complex of Columbus (16SFL8994) and the Northern Chattahoochee Valley. This action will isolate the 5th Division and permit its defeat in detail depriving the La Ban of one-third of its heavy mechanized armed forces.

La Ban forces maintain control of towns and villages in the remote Upatoi River and Hichitee Creek Valleys. The Tibor Brigade remains Headquartered in Cusseta (16SGL0976) with the 1st People's Battalion. Small elements of the 2nd and 3rd People's Battalions are positioned throughout the region to control population centers, roadways, and critical facilities. The 3rd People's Battalion is generally north of Cusseta.

The 3rd Co., 3rd Peoples Battalion is Headquartered at McKenna Military Depot (16SGL056830) with the 1st (Cobo) Platoon. A platoon of technical vehicles (6 x SUVs and pick up trucks with heavy automatic weapons) has been attached to the 3rd Company. The technical platoon forms the primary element for the 3rd Company's immediate reaction force. Technical vehicles not on patrol in the vicinity of the Depot, the Airfield, or McKenna are dispersed south of the Depot along the roadway and in the wood line vicinity 16SGL057827. A composite mortar platoon of one (1) 120-mm M1943 mortar and one (1) (U/I) 82-mm mortar is deployed inside the Depot fence. The battery is dug-in at grid 16SGL054833.

The 1st (Cobo) Platoon maintains a squad-sized force at the McKenna Airfield. This squad supports and secures the airfield facilities, cadre, and maintenance staff. The remainder of the Platoon provides security forces in and around the McKenna Depot and the town and provides the infantry element of the reaction force.

The Company's 2nd (Catanga) Platoon is deployed in the vicinity of the Ochillee Rail Yard (16SGL028860). The platoon secures the rail yard and road and rail crossings and access points in the immediate area.

The Company's 3rd (Hobbo) Platoon is deployed in the vicinity of a logistics support area (16SGL099865). The platoon maintains security checkpoints in vicinity of the road intersection of Hourglass and First Division Roads (16SGL099867) and the road intersection of Red Diamond and Plymouth roads and Helmet trail vicinity (16SGL112847). This Platoon conducts dismounted patrols between the two (2) security points.

McKenna Airfield is occupied by a 20-man detachment from the La Ban Air Services Squadron. This detachment provides local air traffic control duties, light aircraft maintenance, and refueling. The facility contains one of three Gordonian CUDO laser alignment devices. The system provides calibration and systems alignment for a variety of ATGM and artillery laser designation systems and is essential to maintain accuracy for these systems. The CUDO, a 2-meter by 3-meter device with 3 lenses, is maintained in the hangar.

The logistics support area (16SGL099865) is operated by a 20 to 25-man detachment from the Tibor Brigade's supply and services element. The site is believed to be being filled to provide a fuel and ammunition cache site for the Gordonian Army's defense of the Chattahoochee River line.

Observations of exercises of the reaction drills by 3rd Company to the McKenna Airfield indicate use of routes through McKenna. The primary route is the hardtop road direct to the airfield; however, two daylight drills have been observed bypassing McKenna and approaching the Airfield from the East (16SGL072841). No drills approaching from the Depot have been observed, presumably because of fences and gates. Daytime reactions vary from 17 to 20 minutes from alert along the primary route. Night drills are less frequent. The best observed night reaction time was 28 minutes. However, two (2) of the technical vehicles and the infantry support, became disoriented and their arrival was delayed by an additional 10 minutes. Only the main road route has been observed in use during night drills.

One daylight reaction drill from the McKenna Depot to the Ochillee Rail Yard has been observed.

The composite mortar platoon routinely reports ready to fire eight (8) minutes after alert, both day and night. No live fire training or registration firing has been observed by the composite platoon.

Appendix J

Table of Contents for Notebooks

Table of Contents for Ft. Benning Scenarios

Appendix K

Extract from User's Manual – Example of How to Use the Scenario Tool Set

Customizing the Scenario - Example. This section provides an example of a way to employ the scenario tool set to support an evaluation of a selected leader skill. For this example, we track the development of a customized scenario to assist in evaluating a potential deficiency in Infantry leader skills or training, the employment of netted fires to support his mission.

For the purpose of this example we will assume that a population of 12 Infantry captains, all graduates of the Infantry Captain's Career Course (ICCC), has been selected. To establish the baseline, four captains will undergo evaluations as the control group using the current force in the available scenarios. The eight experimental group captains receive FFW and FCS orientation training with special attention on execution of netted fires, but would receive no training on principles of employment or planning. The eight captains in the experimental group will be commanders of a future force element. The process of developing and scaling the scenarios and the selection criteria for the factors of METT-TC is outlined in the five steps below.

1. Begin the process by determining the enemy force or forces required. Since speed and accuracy of the delivery of munitions is a critical element of netted fires, it would be most appropriate to use the conventional or mech-based enemy (*Tab D2*). These opposing forces have increased protection and speeds. For the purpose of this evaluation, this enemy model presents the more challenging opposing force.

2. All types of available terrain present unique challenges to employment of netted fires. We have determined that both basic types of available terrain, high deserts and woodlands, will be essential. Additionally, employment of fires in and near urban terrain presents unique challenges. For the purpose of this evaluation, all missions (airfield and site) at both locations (NTC and Fort Benning) have value for the evaluation. The control group captains, identified to establish the current baseline, will conduct missions against enemy forces on both the NTC <u>and</u> Ft. Benning terrain (*Tab G2 and G6*). The experimental group will follow a similar structure, however, each mechanized-based scenario will be executed twice to increase the sample size. The biographies for key personnel can be used without edit or modification (*Tab F2*).

3. At first look, light and weather data may not seem to be a factor in the netted fires. Closer examination of weather factors indicates that the cooler, overcast, windy winter days at NTC (*Tabs A, B, and C*) provide the greatest challenge to long-range observation in the high desert. Weather appears to be a neutral factor at Fort Benning (*Tabs B and C*). However, the increased foliage of the summer months tends to hamper long-range observation and increase concealment (*Tab A*). The selection of winter weather at NTC and summer at Fort Benning introduces environmental factors that create the greatest challenges to target acquisition and accurate delivery of fires.

4. Selection of the friendly force models to be employed was addressed earlier. The control group will use the current light Infantry force (*Tab E1*). While examining an intermediate force

could be of value, netted fires are not a capability of the SBCT. The experimental group will use the future force model (*Tab E3*).

5. To support the research objectives, the Consolidated Incident List (*Tab H*) will be reviewed and refined to assure inclusion of Optional Events that should initiate fires, cause fire coordination, and create ROE decisions for employment of fires. Some examples include:

   a. Enemy patrol sighted by subordinate element (can vary the location).
   b. Lead element is ambushed by enemy patrol (6 to 8 personnel).
   c. HQ section receives sniper fire.
   d. Lead element encounters civilian woman and three children. (Relate by time and location to hostile action.)
   e. Subordinate element receives indirect fire.
   f. Subordinate unit observes/hears activity (possible enemy) on a ridge approx. 700 meters from the movement route. (Positive identification of target is not initially possible.)
   g. Subordinate element reports receiving sniper fire.
   h. Higher HQ fire support (mortars) is reported as not available to provide supporting fires on the OBJ.
   i. If requested, fire support (mortars/artillery/ A/C) engages the wrong grid and impacts friendly troops (other unit).
   j. Higher HQ reports that the bombs on enemy reaction force missed/ineffective. Location of the enemy mobile reaction force is unknown.
   k. Higher HQ reports that Co in the blocking position to the east has been bypassed. Enemy forces are capable of counterattacking from the southwest.
   l. Higher HQ reports 6 to 8 medium enemy helicopters are enroute into the AO from the south.
   m. Subordinate unit encounters accurate long-range fires from enemy bunker beyond the objective area. Fires make it impossible to continue/complete mission. Unit is unable to suppress/ engage the bunker. (Modify to place near a known civilian occupied area.)

The identified events can be integrated into the scenario. Additions and alterations may be made to the provided materials. However, it is recommended that test scenarios be run to assist in determining unintended consequences.

Scenario Execution. Once the METT-TC factors have been selected and preliminary or prerequisite training, when/if required, has occurred, the next step in the process is to provide the tools to the captain to orient him on his mission and issue him the order. For planning, the OPORD brief and materials orientation should require approximately 20 minutes. He must then read it, study it, and plan. He should prepare an OPORD or notes to brief from, and he may desire to supplement the existing graphics for movement and fire control, as well as, fires/effects planning. Depending on the experience of the captain, the process of developing the OPORD may take from 30 minutes to 2 hours. Presentation of the developed order and briefing role players will require an estimated 20 minutes. An additional 10 minutes should be provided to permit a backbrief/rehearsal/preparation period between the leader and the role players. While

the simulated unit may now be prepared for execution, programming and preparation time may be required for the exercise/simulation system programming.

The OPORDs have been written in a manner to reduce implied tasks and "hidden missions." However, there is a significant volume of information to review and assimilate. The leader will be briefed on his parent unit (battalion or company) OPORD and issued the following items.

1. The map board with enemy situation overlay and MCOO (NTC or Ft. Benning with the appropriate enemy situation),
2. The terrain analysis for the AO (*Tab A*),
3. Light and weather data for the appropriate period (*Tab B and C extracts*),
4. The written enemy situation (*Tab D1 or D2*),
5. The organizational chart of the unit he commands/leads (*Tab E1, E2, or E3*),
6. Biographies for the unit that he commands/leads (*Tab F1 or F2*), and
7. The OPORD (*Tabs G1, G2, G3, G4, G5, or G6*) and the appropriate operations graphics for the mission

While some items are of greater value in his planning process than others, all items are essential to OPORD development and mission execution.

The commander/leader should be afforded adequate time to review all issued items. During the planning process, a role player should remain available to act as the higher headquarters and adjacent units to answer questions, clarify details, and serve as a point of contact for coordination.

When the OPORD is complete, role players, trainers, simulation technicians, and evaluators should receive the order briefing. Clarifications are key. It is essential that the "unit" execute the commander's/leader's intent. After clarification, a "table top" rehearsal or backbrief by the role players should be conducted to provide the commander/leader confidence in their understanding and permit final adjustments.

Final adjustment of simulation programming and/or adjustment of the scenario incident list may be required. Role players, as the reporting "eyes on the ground" must be prepared to "report" the incidents and details at the appropriate times and locations. They should remain in "character" as indicated in the provided biographies. After start of the exercise, role players must remain flexible and adaptive while following the incident list by time. Details, when requested, must be provided in a manner that does not disrupt the focus of the evaluation.

At the end of the scenario, role players should assist both observers and the trainer in clarifying observations and details in a factual manner.